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From the Editor's Desk

A NOTED FURNITURE DESIGNER recently brought out a significant point that should interest every manufacturer who uses any kind of finish on manufactured products. He pointed out that many manufacturers spend considerable time, money and effort in designing their products, but when the question arises as to a suitable color, finish or decorative treatment, they are ready to listen to random suggestions from practically anyone in their organization. If something "sounds good" the suggested color or finish is ordered. Apparently they give no thought to the fact that just because a finish or color happens to please the manufacturer, that is not necessarily a good reason why it will have a sales appeal with the majority of people who are prospective customers for the product.

Color in finishes, like styles in dress and models in automobiles, has periods of popularity and every manufacturer will do well to remember the improvised slogan that: "the color applied to the product need not be your favorite color or finish—so long as it is the favorite of your customers!"

Sales and profits depend little upon tradition and personal opinions; their life is founded chiefly on timeliness. Change marches doggedly on, but popular trends in everything including finishes cast their shadows before. Hence it may be seen that the manufacturer must use every means possible to anticipate the trend in style and color. It is important that more time and effort be given to producing permanently attractive and enduring finishes.

What has just been expressed above, coming from such a source and at such a time, has greater significance than appears on the surface. It means more than merely a warning to manufacturers to look to their finishes. It represents an awakening in the industry to the importance of finishes and of color, and the part they play in sales. It challenges the thoughtful manufacturer to carefully consider every source from which news and information is broadcast on the subject of finishes, to be well informed on the new materials that are being developed daily—to stop following the rococo, and to start making tradition.

W. H. Rohr

Managing Editor

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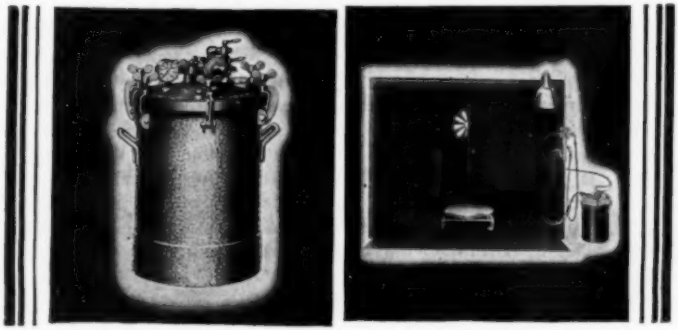


True High-Solid Lacquer

By
KAM N. KATHJU

Something new in the lacquer industry—a true high-solid lacquer that produces a deep lustrous finish with fewer coats . . . . flexible, almost marproof—very slight film shrinkage, opaque to ultra-violet rays . . . .

THERE ARE on the market today three main types of lacquers, which, for purposes of simplicity, I will classify as: (1) ordinary lacquers, (2) so-called high-solid lacquers, and (3) true high-solid lacquers.

Ordinary Lacquers

The ordinary lacquer, as we all know, consists of 28 to 32% of film-forming material. These materials in turn consist of: (a) nitrocellulose, (b) gums and resins, (c) plasticizers, (d) softeners, and (e) pigments. In short, these ordinary lacquers consist of 28 to 32% solid material. The remainder is a mixture of solvents and non-solvents—all volatile materials that are a total loss after spraying.

The ordinary lacquers are so formulated that to be suitable for spraying they have to be reduced further—approximately 80 to 100% with ordinary thinner, to an approximate viscosity of 30 to 32 seconds in Ford Cup No. 4, for spraying purposes; thus at the point of gun they have 14 to 15% solids, and to obtain a satisfactory finish four double coats of material are generally recommended.

So-Called H. S. Lacquers

The so-called high-solid lacquers are merely ordinary lacquers, except that they have 37 to 41% solid non-volatile material, consisting of the same constituents as referred to under ordinary lacquers, but they are different in that the volatile content has been reduced to 59 to 63% by holding out lacquer solvents. The advantages of this lacquer are apparent:

1—Manufacturing companies do not ship as much thinner as in the ordinary lacquers.

2—These so-called high-solid lacquers are very viscous, with the result that they do not, if ever, settle badly. In short, they do away with the hazard of off-color batches, generally found in ordinary lacquers, simply because the pigments do not settle out.

Note: This article is copyrighted by K. N. Kathju, Detroit, Mich.

Because of their heavy body or higher viscosity, these materials must be reduced in the proportion of approximately 40 parts lacquer to 60 parts thinner. When thus reduced these lacquers are identically the same as ordinary lacquers reduced 50/50 with thinner. When reduced 40 to 60, this lacquer has a good spraying viscosity, conforming to a Ford Cup No. 4 viscosity of 30 to 32 seconds at 80° F., and having approximately 15 to 16% solids.

In this case, like the ordinary lacquers, it is imperative that four coats of lacquer be sprayed to obtain a satisfactory finish.

True High-Solid Lacquers

These lacquers are remarkably different from any of the two lacquers described above in that their solid composition is different from that of the ordinary and the so-called high-solid lacquers. The nature of two of their principal constituents is such as to be remarkably different from anything used heretofore in the formulation of ordinary lacquers, with the result that these true high-solid lacquers can be made to contain approximately 47 to 51% nonvolatile material, the balance being ordinary lacquer thinners.

In spite of this extremely heavy solid content, these lacquers are so formulated as to reduce in the proportion of only two parts of lacquer with one part of thinner, to a good spraying viscosity of 26 to 30 seconds in the Ford Cup No. 4 at 80° F. When thus reduced, these materials have 32 to 34% solids at the gun. In short, this reduced material has as much solids or film-forming material at the time of spraying as the ordinary lacquer at the time it is received and prior to its reduction. To obtain a quality finish, therefore, it is only necessary to use two coats of this material as against four in the two previous cases.

These lacquers do not contain a high percentage of pigment. In fact, in spite of the ratio of pigment to other of its constituents being the same as in any other lacquer, this new product has positive solid-covering minus the chalking and other drawbacks of solid-covering, highly pigmented lacquers. The accompanying table gives a comparison of film-forming material in the ordinary lacquer, the so-called high-solid lacquer and the true high-solid lacquer. After referring to the data included in this table it is apparent that the true high-solid lacquer gives as much film deposition in

Comparison of Characteristics of Three Types of Lacquer

Type of Lacquer	Solids as received	Reduction of material to thinner	Viscosity Ford Cup No. 4	Average solids at gun	Number of coats	Total % of film-forming material
Ordinary	28 to 32%	50/50 or less	28 to 32 sec.	14 to 15%	4	56 to 60%
So-called Hisolid	37 to 41%	40/60	30 to 32 sec.	15 to 16%	4	60 to 64%
True Hisolid	47 to 51%	2/1	30 to 30 sec.	32 to 34%	2	64 to 68%

two coats as the other two types in four coats.

In reference to the merits of true high-solid lacquer, I might mention the following.

1—Two coats of this material are equal to four coats of either of the other two.

2—Provides an extremely flexible film because of the nature of its film-forming constituents.

3—One of its principal constituents is positively opaque to ultra-violet light rays and resists its destructive action.

4—Outwears ordinary lacquers by two to one on exposure and use, because of its quality of being opaque to ultra-violet rays.

5—Almost a mar-proof finish.

6—Extremely easy to sand without gumming sandpaper.

7—Positively yields a remarkable and enduring high luster on polishing.

8—Will not dull nor get smoky and smudgy on exposure.

9—Very little film shrinkage, which means, that lacquer has remarkable fullness, like varnishes, of the last decade.

10—Absolute covering in a single coat—even though percentage of pigment is same as in ordinary lacquers.

11—Very economical to use because: (a) the consumer, to attain a certain film thickness with ordinary lacquer, uses 2½ times as much thinner as is needed for obtaining similar film thickness with this high-solid lacquer; (b) fewer spray men are required to do the same work; (c) fewer spray booths, pressure tanks, etc. are required; (d) due to the nature of the material less sanding is required than for ordinary lacquer, thus a saving in labor, paper, etc. is effected.

12—The final finish is the last word in beauty and depth—a powerful sales factor.

13—Positively no bridging trouble around mouldings, etc., because it has very slight film shrinkage as compared to ordinary lacquers.

Finishing Birch

Birch is one of our native woods that I don't believe has as much recognition as it should. While not expensive, it has all the qualifications necessary for good cabinet work. It is really one of our leading hardwoods, sands well and when stained with water stain the grain raises very little compared to some other woods. In view of the closeness of the grain the surface requires little or no filler; also it "holds up" the finish well.

In the manufacture of store fixtures birch is used quite extensively. On several very high grade jobs we have used some curly birch panels which, after being finished, I believe were the most beautiful I ever saw. Birch also makes a very good wood for furniture and is used quite extensively where a good imitation mahogany is required. It also finishes well in walnut, cherry, and several other popular shades.

Where durability is required, I believe birch stands head and shoulders above all other woods in its class—such as for hotel and church furniture. I believe the time is near at hand when we will see much more of this wood.—Geo. A. Anderson.

Pearl Essence

Jos. H. Meyer Bros., 220 25th St., Brooklyn, N. Y., has prepared for distribution its leaflet "Richelieu Pearl Essence" which tells what Pearl Essence is, where it is used, and how it is applied. This leaflet also contains a price schedule.

The Why of Muddy Finishes

By
A. P. NONWEILER

Referring to the cloudy, semi-opacity of what was intended to be a clear, transparent finish; obviously, something has occurred between the wood and last coat to cause this, and it is my purpose here to investigate it

"I am enclosing an article on muddy finishes; it is perhaps not in keeping with brevity, and yet by no means exhausts the subject.

"There is such a general misapplication and misunderstanding of terms that it is difficult to confine discussion. I have not attempted to give the chemistry of causation, for I believe it too technical for the average foreman who knows little of colloid chemistry."—

Arno P Nonweiler

THE PREPARATION of wood previous to finishing is important because in some cases it affects the transparency of finishes. In the case of undried wood the moisture often causes grayness to the filler and to the lacquer, producing in extreme cases a rather milky cloudiness. This sometimes occurs to finishes despite care taken in drying if the article is exposed to excessive moisture such as bathroom doors in hotels. The remedy here is refinishing.

Sometimes, by accident, oil stain is used to stain wood previously glue sized; in this case the stain is not allowed to dry properly in the time ordinarily allotted to oil stain, and it remains active on the surface. It becomes cloudy when in contact with lacquer. Sometimes a good sanding, followed with a coat of shellac or lacquer, cut two to one with a good thinner, will be the remedy.

Washcoating; Sanding; Coloring

Some finishers, with economy foremost in their minds, apply water stain to wood and instead of wash coating with shellac and sanding, fill directly over the stain. Water stain raises the grain or fibers so that they protrude upwards and collect a considerable amount of filler, which even careful wiping does not remove. Naturally there is such a great amount of filler on the surface that the effect is extremely dirty and muddy in appearance. The only remedy is refinishing.

Improper sanding causes muddiness. The growth of wood is not even; it is dense in some portions and porous in others. Unless the wood is carefully sanded wherever the porous parts occur, more filler will collect between the upstanding fibers and cause muddy spots of varying intensity.

In order to produce colors of extreme depth, the finisher sometimes exceeds the normal solubility of water for dyes, or quite often neglects to replace the water lost by evaporation, and in so doing he gets more dye into the stain than can be dissolved. The result of this is an excessive concentration of dye on the surface, quite well known as "bronzing," creating the general color effect of the feathers of a peacock. This often produces muddiness. If it is noticed before

the first coat, the surface should be brushed with alcohol and carefully wiped; on large surfaces add 50% water.

Fillers; Equipment

Recently many quick-drying fillers have made their appearance among us, and while they undoubtedly possess merit their application is not sufficiently understood. Enthusiastic salesmen state they may be wiped "just like an oil filler" and herein lies the difficulty. As a rule they are composed of quick-drying solvents calculated to evaporate quickly and dry hard and tough.

There is an ever increasing tendency to spray filler, and unless the pressure is reduced to about 20-lbs., the solvents evaporate prematurely, causing the filler to set hard and fast. Piece workers as a rule figure on so many pieces per hour and generally make them. Under conditions like these much filler remains and causes a muddy appearance.

Many plants are working with worn-out equipment, particularly compressors; here the pistons and rings are worn, permitting the passage of oil and oil vapors to enter the air lines and are distributed in everything that is sprayed. This shows up in white spots or smudges, depending on the amount of oil present. Such equipment should be replaced or repaired.

The general abuse of pigmented shading stains contributes greatly to opacity and muddiness. High grade shading should always be done on the wood directly over the stain, and done with a dye stain —not a pigment stain.

The too liberal use of flat lacquer, and varnish is a contributing factor to muddiness. Rubbing with oil and water on lacquer causes "blooming," commonly referred to as muddiness because of the semi-opacity effect that is produced.

In short—carelessness spells muddiness. The greatest necessity exists today for the foreman to know his materials and knowing his materials, should not abuse them or attempt to extend their possibilities.

Scientific Instrument Price List

The Gray Instrument Co., 64 W. Johnson St., Germantown, Philadelphia, Pa., announces its new illustrated reduced price list on "Queen" scientific instruments which will be sent upon request. This company also specializes in repairs to electrical measuring instruments, engineering instruments, optical instruments, and general scientific instruments.

Colors Popular for Automobiles

According to the July issue of the "Automobile Color Index," published monthly by the Duco Color Advisory Service, black is still popular in the automobile field, although there appears to be a definite rounding out movement in this trend, indicating the probability of an approach to the point of diminishing appeal.

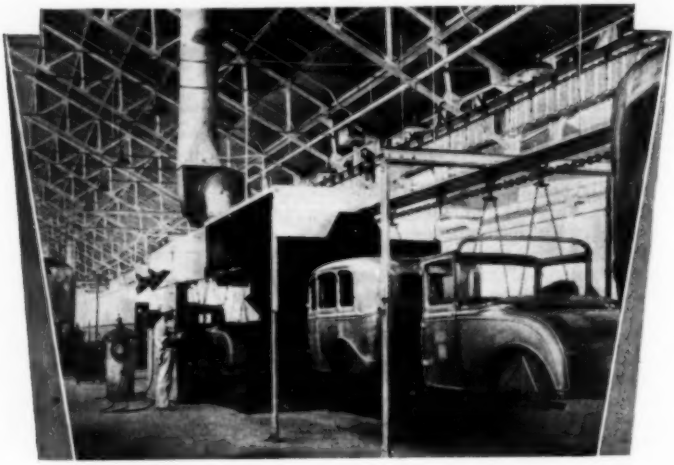
Blue is continuing to advance moderately and appears securely entrenched in second place. The demand seems constant for bright clear blues or a few shades darker than medium.

Green has held constant the index position recorded last month, terminating its recent decline.

Brown, commencing to regain some of its lost favor, has advanced from fifth to fourth place. The advent of coffee cream and ravenswood brown in the list of leaders is indicative of interest in bright, light, clear brown values.

Maroon has retained the position gained last month. Due to the fact that the indices of most of the maroon leaders have advanced somewhat of late, it seems logical to suppose that maroon's recent advance will be extended further in the near future. The line of values in the maroon color family remains practically unaltered since last month.

Gray is now heading downward for the first time in six months. Light brownish Saxon gray has been the only recent addition to the group of gray leaders.



Ford Automobile Finish—I

By
P. C. BARDIN

This article describes the Ford Motor Co.'s production methods and illustrates equipment used in cleaning and drying metal surfaces, spray and dip finishing, drying and baking finish coats and mechanically handling Ford automobiles—at a typical branch plant

IN ALL industry, perhaps the greatest factor that contributes to success is the use of prescribed, standardized production methods based upon applied research. Experiments in methods and materials conducted on production lines are costly from the standpoint of time and money expended and dangerous if the results prove unsatisfactory.

The Ford organization does nothing by chance, and it is because of absolutely controlled methods, materials and equipment that the Ford automobile finish has attained its high standing among the beautiful and durable motor car finishes. Changes in the process which are constantly being made to improve the appearance and quality of the finish are a direct result of both laboratory and practical tests made prior to the time these operations and materials are put in work.

The Ford system of production does not tolerate waste, therefore inspection is stressed throughout the entire plant. When corrective labor is required, it must be performed at the end of the operation during which the inperfection occurred. There is no back-tracking

of car bodies, and none is removed from the line until completed.

No attempt is made to synchronize the body finish line which is one continuous overhead chain, with the fender, sheet metal, wheel or chassis lines. Each of these separate lines is operated on a definite schedule, and as the various units are finished, they are either assembled directly from the line, or placed in their particular storage. The storage for car bodies consists of nine slat-type power conveyors.

The lacquer and enamel storage tanks are located in a separate building from the main plant. Underground pipe lines connect these tanks with the central pressure tank room which is in a glass enclosure in the finishing room. A system of pipes lead from the tanks in this room to the various spray booths throughout the finishing department.

Car bodies are received in a sub-assembled state. Sides, backs, doors and fronts are washed thoroughly with lacquer reducer. Small parts are run through a washing machine in which boiling water is used. Immediately following the washing, these parts pass through a burn-off oven where they are subjected to 600° F. for about five minutes. This treatment dries the pieces and removes any grease or oil from all concealed parts as well as exposed parts. High pressure steam is used to remove grease under drip mouldings.

At this point all of the inside metal surfaces which will become concealed or inaccessible in final assembly, are given a brush coat of oxide primer to prevent rusting of these areas. All metal surfaces which contact either wood or metal in assembly are given a brush coat of a graphite base paint. This prevents squeaks and is commonly known as sound-proofing.

Final assembly of the car body is the next operation. The entire body is then sanded and given two thorough washings—first with lacquer reducer and second with an alkali solution to remove any existing traces of acid. There are two inspectors on the clean-up line. The Ford management of production considers metal cleaning of sufficient importance that it requires all operatives handling car bodies between the final washing and the prime coat to wear heavy rubber gloves. This eliminates the possibility of grease and perspiration coming into contact with the metal surfaces.

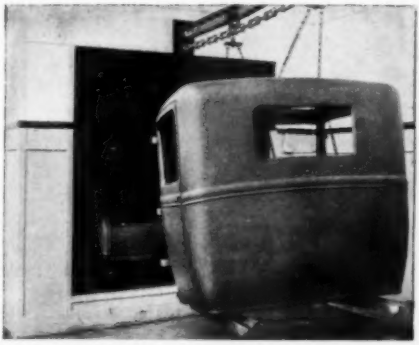


Fig. 1—Car body entering oven after leaving spray booth where the prime coat was applied.

After the final washing and inspection, car bodies are transferred from the slat type conveyor to the overhead chain which carries them to spray booth No. 1

where an oxide primer is sprayed over the entire inside and outside surface. They immediately enter an oven through which they travel as the finish is being baked.

Upon leaving the oven, the body is glazed with pyroxylin putty, the workman using a flexible knife in this operation. The car body is hot so the putty dries immediately, permitting the glazed areas to be sanded at once. The entire body is tack-ragged thoroughly and enters spray booth No. 2 where a pyroxylin-base surfacer is sprayed over the entire outside surface and exposed inside areas. After drying 10 minutes, a second surfacer coat is applied in spray booth No. 3, and the car bodies enter the oven for a short drying period.

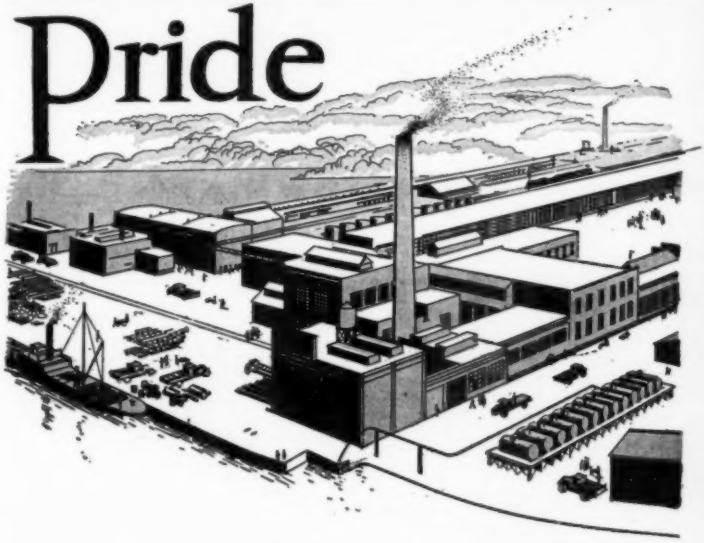
Car bodies are wet sanded on

Fig. 2 (Left)—The surfacer coat is wet-sanded at this station.

Fig. 3 (Below)—Mist coat spray booth. Several spray booths at this plant are made of glass which allows natural light to enter booth. The glass is washed at the end of each day. All metal booth interiors are also washed and coated with a soapy solution at the end of the day.

Fig. 4 (Left)—Lower car body masked with paper held in place by tape; notice metal templates set in position to protect window reveals. The upper part of body has received its second coat of colored lacquer.

Pride



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the wet deck where there is one inspector with each group of five sanders and one chief inspector for the entire operation. Bodies are given a cold water wash at the end of the wet deck and then enter a drying oven. Upon leaving this oven they are tack-ragged and any sanded-through places are touched up with surfacer, a small spray gun being used for this purpose. In booth No. 4 all of the interior exposed parts of the body are given two double coats of colored lacquer.

The next operation in booth No. 5 is to spray the outside lower body with the first double coat of colored lacquer. By double coats is meant spraying first horizontally, then vertically. An air drying period of 20 to 30 minutes is obtained, also tack-ragging and inspection as bodies travel between booths No. 5 and No. 6. In the latter booth, the second double coat of colored lacquer is applied to the lower body.

Another drying period of 20 to 30 minutes follows, during which time the lower body is masked with paper held in place by 1-in. tape. Metal templates are inserted to protect window reveals.

In booths No. 7 and No. 8, two double coats of colored lacquer are applied to the upper body, with 20 to 30 minutes drying periods between and after the last coat. Masking is removed and a ding operation is performed to remove any slight depressions which were not visible before.

At this point car bodies are transferred from the overhead chain to the slat-type conveyors of the trim lines, where they remain 2½ hours. This period allows ample time for the final lacquer coats to dry thoroughly.

At the end of the trim lines, car bodies are wet-sanded. Again on this wet deck there is one inspector with each group of five sanders and one chief inspector.

Following wet sanding, car bodies are washed with clear water and blown off with air. Then they are tack-ragged, inspected and touched up if necessary. The next operation is to spray a mist coat of lacquer reducer over the entire outside surface of the body, this reducer acting as a solvent for the subsequent lacquer coats. Immediately after the application of the mist coat the body enters a drying oven.

Upon leaving this oven, wheel housings are sprayed with black lacquer and the car body enters the polish line. Here power polishing wheels are used on all flat and slightly curved surfaces, and hand polishing is employed for moulded and sharply curved surfaces. Touch-up work is done by using the polishing wheel free hand. Bodies are then inspected and enter the hardware line where all interior hardware is applied.

The final operations on the car body include buffing the entire outside surface with wheels made of soft wool. This treatment produces an excellent polish. Mouldings are hand striped at this point and after air-drying 15 minutes they are inspected; then the car bodies proceed either to the assembly line, or to the car-body conveyor storage lines.

Editor's Note: This is the first of two articles about the "Ford Automobile Finish." In the second, which will appear next month, the finishing operations on fenders, wheels and hoods are outlined.

An example of proper color balance is found in the automotive industry where numerous color combinations have been tried out on many makes of cars.

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Coloring and Finishing Decorative Plaques

By
ANSON GUILD

How plywood is prepared, painted, decorated, finished and rubbed to make beautifully designed artistic plaques that are used for ornamentation of fine furniture and interior furnishings . . . . at Barker Bros. Mfg. Co., Los Angeles

THE MANUFACTURE and use of transparent color plaques as inlays for fine furniture and for other purposes has been developed to a point of high proficiency by Barker Bros. Mfg. Co., of Los Angeles, Calif. A growing demand has been built for these pieces of craftsmanship, such as would indicate a place for the same or similar items in many localities.

The plaques resemble delicately burnished and tinted tile exquisitely decorated. The observer is astounded to discover that the piece he is examining is made of wood. While the appearance is unusual, the manufacture of the plaques involves nothing extra in the manner of special machinery or tools—the most important feature being to find craftsmen (either men or women) of sufficiently developed artistic ability to conceive and execute the patterns.

Any kind of plywood that takes paint and lacquer well may be used. The operative must, of course, have in mind the use to which the piece is to be put, and the color scheme to be followed, because in such subtleties does the value of such wares largely de-

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When you consider how superior is the mixture of shellac and Murphy Waterproof Mixing over plain shellac, and when you realize that it costs you no more than plain shellac of good quality, you will certainly want to know for yourself by first hand experience all about this unusual product.

Order a quantity *now* and try it out on an actual job. Or ask us to give you a demonstration.

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Air-drying and Baking Varnishes
Enamels, Lacquers and Stains for Brushing, Spraying and Dipping

pend. The wood is sanded to exceptional smoothness and rubbed before any paint work is done.

Custom Designs; Hand Painting

After a sufficiently smooth surface has been prepared the wood is usually painted with a basic background color. The artist then paints by hand the design desired, using transparent oil colors, or any combination of transparent colors and flat paint sought to obtain the desired effect. In fine work of this kind elaborate use is made of the pastel shades, and of silver, gold, bronze and metallic effects.

After the design is painted, four to six coats of the finest lacquer are then put on, and the plaque is rubbed until its surface is as smooth as that of polished glass.

The manufacturer contemplating entering this phase of furniture making must understand that cheap and inefficient craftsmanship can not be tolerated. Only persons of a high degree of artistry can accomplish the demands set for such items; consequently their price is relatively high and the plaques have a decided tinge of the extraordinary and exclusive in their make up. Being hand made it is plain that none will be exact duplicates, and this alone gives them added value to the connoisseur.

The Barker Bros. plaque manufacturing department employes about eight girls and women, it being discovered that they lean eagerly to this type of work and become exceedingly apt.

Artistic Craftsmen

A great deal of this craftsmanship product is made on order. The pieces are often incorporated as a part of fine furniture—often made to order—and may be placed as inserts in beds, vanities, dressers—small pieces even in chairs—and other articles of the bedroom. A growing custom is for the tops of coffee tables, it having supplanted to a degree the usual cement-set tile. The colors and assortments of designs are much more flexible in wood than tile, and for this reason the plywood pieces are much sought, especially by the motion picture folk in and about Hollywood.

Magnificent trays are made which lend themselves admirably to the transparent color work. There is some demand for table tops other than coffee tables, made in this manner. It is not uncommon for the artists to enter the homes of the prospective buyers and make custom furniture inserts that will be in harmony with the draperies or paintings or carpets in various rooms.

The principal hazard to such production is the inability of some manufacturers perhaps to appreciate the high type of craftsman necessary for this work. Such craftsmen must have a thorough going knowledge of design, color blending and harmony, proportion, and accommodation, in addition to being artists in painting of no mean ability. Once this fact is acknowledged, there is no reason why many producers of fine furniture cannot use this idea—which is thought to have been first developed in Los Angeles in a large commercial way—to advantage in their plants. It has been found a splendid stimulus to business by Barker Bros. throughout Southern California.

The fact that the selection of colors is becoming a matter of accurate scientific procedure will be a distinct revelation to many marketing executives.

Heavy Viscosity doesn't always mean a heavy film

ANY lacquer may be made in any viscosity. That is, one with only a very small percentage of solids may be made so thick that you can't pour it from the can. Likewise, a lacquer that will give you excellent build may appear at a disadvantage from its thinner appearance.

No. 6218 Heavy Bodied Clear Gloss Lacquer produces a heavy film of material. Two coats of No. 6218 are equal to three of many lacquers, and one coat will often suffice. If your topcoat is a flat lacquer, No. 6218 produces just the kind of foundation you need.

No. 6218 Heavy Bodied Clear Gloss Lacquer may be reduced farther than other lacquers. Since thinner costs less than lacquer, the economy is obvious. The working qualities of No. 6218 are unsurpassed. It sprays nicely, will not bloom, and rubs to a brilliant polish. No. 6218 is the all around lacquer for general use. It has body enough for any requirement and yet is very durable.

Will you try No. 6218? Order five gallons at the drum price. Test it carefully. If it isn't all you expect, just ship back the remainder at our expense.

JAMES B. DAY & CO.

CHICAGO

Specialists in
High Grade Enamel, Lacquer,
Stain, Shellac, Sealer, Etc.

Finishing Small Wood Toys

By
JAS. L. RUBEL

Former president of a manufacturing company relates some interesting experiences in the color finishing and decorating of wooden toys, using lacquers and enamels applied by dipping and tumble finishing

THE MANUFACTURE of small toys, made of wood and steel, for sale to the five and ten cent chain stores, offers problems in finishing which are not usually met with in the painting and lacquering of larger pieces.

In the first place we have a definitely small limit of cost in which to work, and in the second place the finish must have the necessary sales appeal to sell the toy over the counter. Dull lusterless toys do not compare with the bright appearance of lithographed tin toys, consequently they are passed by when displayed alongside of their competitors.

When we first started into mass production we purchased a dipping machine, which the manufacturer claimed had sufficient production to take care of our needs. This was a standard machine with nine tanks, capable of a production of 25,000 pieces per day. The racks were made of wood, with ordinary sailor's needles spaced every 2-in., to allow plenty of air space between the pieces.

These needles gave us considerable trouble. They broke from the continual pounding by the operators, or became badly bent and had to be renewed frequently. After several months we finally obtained from an ice-pick manufacturer, a needle with a ¼-in. shank, which tapered down to a fine case-hardened point. These were standard picks for hand awls, and stood up well.

Tried Lacquers; Sealers

As we were new in the field, we wanted to give quality to our product, so we purchased the best grades of lacquers and thinners for our finishing. In a year's time we tried the products of at least ten different paint manufacturers, with the same results from all. Following their directions for mixing, we got from 400 to 500 pieces to the gallon of mixed lacquer, and always had a very objectionable bead on every piece. In time the bead became hard, but it did not improve the looks of the toys.

We then tried a sealer, thinking that perhaps this would eliminate the bead and also cut down our cost by reducing the amount of lacquer used. On the contrary, our cost increased. Finally we hit on a filler made of glue, whiting and water, but this again took too long to dry and it cut down our production. When we increased the percentage of thinner we eliminated the bead, but the lacquer then failed to cover the toy properly, and the wood showed through.

We were using at this time large quantities of California redwood and yellow pine. The redwood was exceedingly porous and the pine was full of pitch, which showed

AT LAST!

The Ideal Sealing Undercoat for Varnish

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SYNTHO SEALER

Dries in an hour. Sands without gumming or excessive dusting. Requires less sanding and lays smoother. Gives perfect anchorage and adhesion for Varnish. Holds out Varnish coats as well as any known type of Sealer. Lessens tendency of checking and cracking.

Made to give

100%
SEALING EFFICIENCY

on endwood, turnings and soft, sappy lumber.

Try it and be convinced. A five gallon sample for trial can be had at drum price. Send in your order today.

PROTECTIVE SPRUANCE QUALITY FINISHING PRODUCTS

THE GILBERT SPRUANCE CO.

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Richmond and Tioga Streets
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through the lacquer unless the coating was heavy.

Switched to Enamels

Disgusted with the lacquers, we finally decided to try enamels. Another manufacturer who made juvenile furniture gave us his formulas and we changed the entire line to 4-hour enamels. The enamel was thinned with painter's naphtha, 1½ parts naphtha to one part enamel. The articles were dipped twice after drying the first coat for 24 hours. Drying racks were built, into which we slid the racks from the dipping machine. These racks were on casters and could be moved out of the way when filled.

The second coat usually required two days before handling was safe. In spite of the thin coat we still had the bead, and in a more objectionable form, as the enamel bead did not dry for sometimes several weeks, depending on the humidity of the air. Furthermore, our next operation after the painting consisted of imprinting, with a hot brass die and brighten leaf, and the enamel either peeled or gummed up the die.

Return to Lacquer

Again we returned to the use of lacquers, and finally through the cooperation of a lacquer manufacturer, obtained a product whose initial cost was low but which was very heavy in body. This material was thinned 110 parts thinner to 100 parts lacquer, and it gave us excellent coverage. On some colors such as bright red, green and black we used as high as 150 parts of thinner. As this covered from 1100 to 1200 pieces per gallon, our cost was almost cut in half. However, we were not getting the same luster as we had previously with the more expensive lacquers.

In the meanwhile, we had obtained a new source of supply for our lumber and were now getting both red and white gum, tupelo and poplar which were considerably harder, and did not absorb as much lacquer.

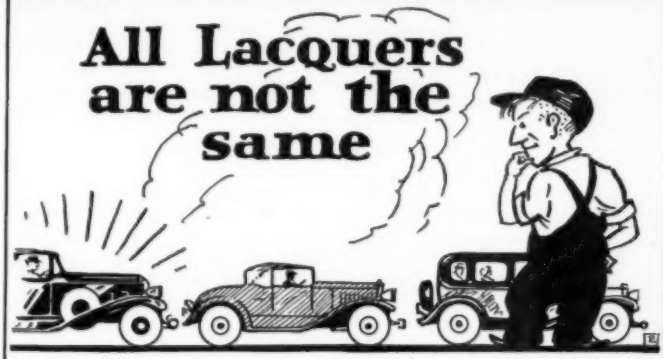
Once again we returned to the use of sealers, and obtained from another manufacturer a milky white product which we thinned with benzol, and which covered from 2000 to 3000 pieces per gallon. This light covering proved to be sufficient to seal the wood, and we were able to increase our covering capacity per gallon to over 1200 pieces. The results were even better than we had anticipated as we obtained a very high luster and practically no sign of a bead. To increase the drying time we slowed the machine down to its lowest speed. Even at this speed we obtained a greater production than we had previously with the more expensive lacquers.

Wheels; Tumble Finishing

Satisfied at last with the finish of the bodies, we turned our attention to the coating of the small wheels which we had been purchasing "ready finished." The difference between the quotations on finished wheels and unfinished wheels seemed too great so we determined to do our own tumbling.

Unable to find a manufacturer of tumblers suitable for our needs we built them ourselves. We designed a tumbler octagon in shape, with one side removable, and with an open side of wire mesh to put on in place of the solid side. These tumblers were 4-ft. long and 18-in. in diameter, made of select hardwood. The ends were reinforced

All Lacquers are not the same



Lac says: "All lacquers are *not* the same. The claim of some manufacturers that their lacquers 'are just as good as the other fellow's but lower in price' is wrong."

Automobile manufacturers changed from oil enamels to lacquers to benefit by lower finishing costs—at the same time securing greater durability and added attractiveness.

Many lacquer users now overlook the advantages obtained by employing high quality lacquers and buy only on price. Therefore their finishes are inferior.

High quality lacquers can be produced at minimum cost by using

PENTASOL AND PENT-ACETATE

the standard amyl solvents for lacquer formulation.

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The SHARPLES SOLVENTS *Corp.*
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with 1-in. angle iron, with a piece of 2-in. shafting protruding from each end. The tumbler was then mounted on hangars for legs and driven at slow speed from an overhead lineshaft. The speed most suitable for our needs was 25-r.p.m.

Lacquer experts were again called in and we purchased an assortment of tumbling lacquers and polishes. The operation is as follows: The small parts are dumped into the tumbler until it is about one third full. About a quart of lacquer is spread over them, the solid door is put on, and they are allowed to revolve for about 20 minutes. This operation is repeated until the articles are thoroughly covered; then the solid cover is removed and the wire door is put in its place. The articles are again revolved until dry. The entire operation requires about two hours, which we found was too slow, as production in the assembly department was continually being held up waiting for wheels.

Dipped, Then Tumbled

We then purchased a clean 50-gallon oil barrel and, cutting it in half, made two shallow dipping tanks. We then made a wire basket to fit. Into this [basket] the wheels were dumped and the whole thing was dipped into a mixture made of one part lacquer to two parts benzol. As soon as the wheels had drained they were dumped in the tumbling barrels and allowed to revolve for five minutes; then polish was added and they were again revolved for five minutes. The result was a nicely finished wheel that cost us about 15 cents per thousand to finish—considerably below the charge made by the wheel makers.

For general cleaning purposes such as the cleaning of the racks, machines, and improperly coated parts, we used a solution of 75% benzol to 25% ethyl acetate.

How to Use Shading Stains

The big thing in modern furniture finishing today is the treating of different veneers before the finishing process begins—bring out the fine figure and color in them, and to be sure these characteristics are not killed by the process of shading. In my experience I find that a lot of splendid possibilities are killed by using shading stains in the wrong place.

I believe it is best to use shading stains on the filler before applying any sealer or shellac coat; in that way you seal your stain from bleeding or fading out. I know of no stain that will hold up when it is applied on top of the shellac or sealer. This is where a lot of finish manufacturing companies get into trouble when it is really the finisher's fault instead of the stain which is so often blamed.

For example, I have experimented on a fine dining room suite for the company I am now with which was killed last spring in the finishing. It was a high grade suite, so by treating the different veneers and bringing out the depth of the finish and sealing the stain from fading the suite is now taking the public's eye, and is beginning to sell. So I think if the finishing foreman will take the right method of treating his veneers and using shading stains, the different paint and color companies will not get the blame for bad stain and filler.—H. R. Fryer.

A high-quality finished surface attracts the eye and always registers favorably.

ZELLAC

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LOWER
LOWEST
PRICES

Haven't You Had Enough of Them?

The hysteria of frantic shopping for low prices has, fortunately, not overcome the sound judgment and mature experience of many good business men.

There are those, however, who in these times have been buying on a low-lower-lowest price basis and have now begun to realize that it is the most extravagant buying policy they could adopt. Many of these buyers have begun to recognize that the extremely low-priced article is not worth what is actually paid for it. You cannot afford to handicap yourself with "bargain" lacquers.

There never was a time when price-per-gallon considerations could influence the Zeller VALUE-per-gallon policy.

To those who recognize the futility of trying to "get by" with cheap materials, Zeller values at Zeller prices are the direct answer to the presentday problem of industrial finishing costs. Zeller prices are the lowest that are compatible with value,—a fact which you can readily determine by your own tests. You will find the resulting reductions of your finishing costs, together with the improvement in finish, a revelation.

Attention is called to our Zellac Super Wood-Sealer, Wood Lacquers, Zelactite grades for Crystaline Finishes, Zellac Outdoor Exposure clear lacquers and lacquer enamels, and innumerable other grades for every conceivable industrial purpose.

ZELLER LACQUER MFG. CO., Inc.

20 East 49th Street New York City

CHICAGO WICHITA
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ZELLER

Spray Room Economies

By
*R. J. FAIRBURN**

Where many small savings are possible in both direct and indirect costs—through better use of materials, equipment, supplies and labor—and how fire and accident hazards can be reduced.

IN MOST large and well regulated shops, where the finishing operations are a real factor in costs, strict rules are enforced for effecting every economy. If it is worth while for such plants to practice these economies, is it not equally worth while for all plants to do so? If orders are to be had now, it is necessary to figure very closely and the efficient plant most certainly has the best chance to get business *at a profit*.

Most of the things mentioned herein are the result of personal observation, in various finishing rooms. They are mentioned with the thought that many of these practices are the result of a lack of knowing what they will lead to or result in.

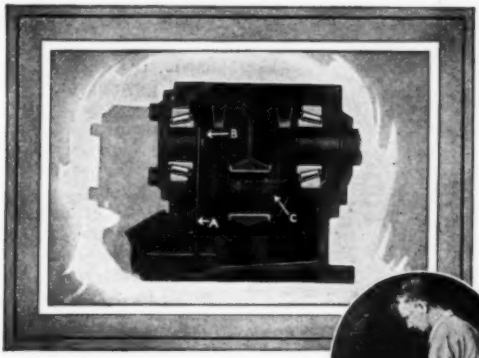
Mixing Utensils

There are few small or moderate sized finishing rooms that have an adequate supply of utensils in which finishing materials may be mixed. Reducers or thinners are often added by rule of thumb which may be as much as 25% inaccurate. Most manufacturers give instructions for the reduction of their product. Too much or too little reduction will always result in either waste or a poor job of finishing.

A few clean utensils for measuring finishing materials will soon pay for themselves—regardless of how much or how little finishing is done in a year's time. It is also well to have plenty of clean paddles or sticks with which to stir materials.

An incident was brought to my attention where a spray man ruined a whole can of light colored enamel by stirring it with a paddle that had been used in black enamel. He probably would have reached for a clean paddle had one been conveniently placed. As foolish as this may seem, it is nevertheless true that this one thing more than anything else is neglected, in the average finishing room.

*With Brevolite Lacquer Co.



Security against excess lubricating oil

with Curtis Centro-Ring Oiling

A Compressor's lubricating system properly designed will not throw oil in excess amount all over the compressor interior but delivers it directly and in controlled volumn to each friction point.

In the Curtis Centro-Ring System, a ring (A) lifts oil to undercut groove (B) in crankshaft. Centrifugal force carries it through ducts in chamber (C) in crankshaft. Then a centrifugal force redistributes it to ribs in the crankshaft which lead the oil to each friction point.

Also there is the Curtis Suction Valve Type Unloader which avoids oil pumping due to vacuum. It operates on the suction valve. When machine is unloaded, valves do not operate as with a suction port unloader.

Isn't the compressor which offers that kind of protection the logical choice for paint spray work?

CURTIS

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This offset or projection in a typical factory building contains a spray booth, the front of which can be closed by a roll curtain of steel. The vertical exhaust flues are protected from down drafts by a hood supported by steel framing.

Any air compressor will accumulate a certain amount of moisture; this is due to condensation. This moisture should be regularly removed through the petcock in the regulator, or by some other means. Unless it is removed, it may be blown onto the work and cause blushing or other trouble.

Air Filters

Compressor cylinder walls will sometimes expand, permitting oil to escape into the air line. This is particularly true where a compressor is overloaded. Unless this oil is removed, it may appear on the work in the form of spots or "pock marks."

An easy way to clean the air in the line of oil or water is to force it through a filter. Such a filter may be purchased or constructed at little cost. This filter is installed between the compressor and air regulator, on the booth.

Container Covers

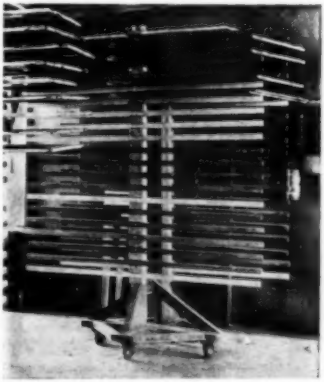
It is not uncommon to find containers of finishing materials with covers removed, or replaced carelessly. This permits evaporation of the volatile solvents and requires just that much more thinner before the material can be used. Often this is the cause of skins forming on oil enamels and varnishes.

Because the snap caps supplied by the manufacturer were a bit difficult to put on and take off, one finisher discarded them and used wads of paper to plug the cans. In this case, a few cents invested in corks would have netted 100% return on the investment, in a short time.

Mixing Bronze Powders

Aluminum, gold, silver, and various other bronze powders are being so extensively used that it is not amiss to say something about using them. These powders are generally used in a liquid vehicle of lacquer or varnish. In some cases they are used in lacquer enamels or novelty finishes such as splatter and veiling lacquers.

Regardless of the vehicle, bronze powder should first be



Portable drying rack which is easy to move to and from the spray booth.

BUTANOL

Time tested, its merit proven by successful lacquer manufacturers everywhere, Butanol is the standard of value by which all other lacquer solvents are judged

COMMERCIAL SOLVENTS CORPORATION

PLANTS: Terre Haute, Ind., and Peoria, Ill.
SALES OFFICES: New York Central Bldg., 230 Park Ave. New York, N. Y. Terre Haute, Ind. Aldwych House, Aldwych, W. C. 2, London, Eng.

mixed with the thinner for the vehicle and then mixed with the vehicle. Assume a hypothetical case where clear lacquer is the vehicle. Determine how much the lacquer should be reduced for good work and measure out this amount of thinner; then determine how much bronze powder is needed for each gallon of reduced lacquer; slowly stir the powder into enough of the thinner to form a thin paste, being sure that there are no lumps that may be dry in the center; add the remaining thinner and stir into the lacquer. This procedure takes little more time than any other and insures a smoother job. In some cases it is well to strain the mixed material before using it. This will remove any large grains of powder.

When the bronze powder is mixed direct with the vehicle, as is sometimes done, there is no assurance that all particles will become wet. This will probably result in rough, lumpy work and may have some effect on adhesion of the material.

The quantity of bronze powder to use with a gallon of vehicle will vary. As much as 2-lbs. of aluminum powder is sometimes used in spar varnish for exterior surfaces, whereas 2-oz. may be as much as can safely be used in some novelty finishes. The manufacturer of the varnish or lacquer can usually give definite instructions for your particular job. Otherwise, a little experimenting will soon show the minimum amount of powder needed for a satisfactory job.

Air Pressure

Correct air pressure is neglected perhaps less often than other items just mentioned. There are, however, cases of orange peel, sags, etc. that are the result of too high or too low air pressure. Correct pressures vary from 100-lbs. or more, for oil enamels to 2-lbs. for veiling and spatter lacquers.

The manufacturer of the finishing material can usually suggest the approximate pressure for best results. Some operators work much faster or slower than average, however, and this must be considered in establishing correct air pressure.

Preventing Fires

One of the most hazardous practices that has come to my attention, is smoking in a finishing room. This practice I believe is indulged in by the spray man less often than by some official of the company. A service man of my acquaintance refused to remain in a room with a cigar-smoking official, while lacquers were being sprayed. This official was surprised but appreciative when he had an explanation.

Recently, I visited a plant where a fairly large item was finished (this building has since burned down). A pressure tank was used with fairly long material hose and air lines, to permit going clear around the work. No booth or exhaust fan was used. A thin sealer coat was being fogged on in such manner that the air was filled with spray dust. Although the operator assured me that he had been spraying finishing materials three or four years, he was calmly smoking a cigarette while the general manager of the company looked on, puffing a large, black cigar.

Another man who has owned and operated his own shop more than 30 years, regularly smokes while spraying finishing materials.

So much good literature is

BINKS *NEW* "THOR"
MODEL 2 SPRAY GUN

Inset photo shows the key control feature which is optional.

Does away with the need of adjusting nozzles . . . .

At last!—a spray gun that gives a flat, oval or round spray without adjusting or changing nozzles—and without interruptions to production or waste of material. The change is made as quickly and easily as setting a watch by turning a thumb screw at the back of gun. This latest development by Binks Engineers provides manufacturers with a new tool to lower production costs at a time when the need for economy is paramount. This exclusive feature is undoubtedly the greatest improvement ever made in spray finishing equipment, but it is only one of many embodied in the design of the new Binks Thor Model 2 Spray Gun.

Write for illustrated descriptive bulletin which tells the whole story. No charge and no obligation, of course. Binks Manufacturing Company, 3001 Carroll Ave., Chicago.

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MAKERS OF EVERYTHING IN SPRAY FINISHING EQUIPMENT
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available on prevention of fires in finishing rooms, that there is little reason for repeating it here. Practically all solvent, used in finishing materials is highly inflammable, and a paint, varnish or lacquer fire is a hard one to subdue.

Faults and mistakes in finishing rooms—like any other line of endeavor—are legion. Those mentioned herein are only a few of the ones encountered. They are found quite often and their correction is really the ABC of satisfactory spray finishing.

Balancing Production in the Small Shop

Production problems of the small shop with limited output are equally as important and sometimes more difficult to solve than those of the large plant. A majority of large plants have a finished-parts stock room from which parts are requisitioned in the required amounts necessary to assemble a given quantity of finished pieces. This system promotes balanced production, in that large quantity lots may be put through the fabricating and finishing departments.

In the small shop, it is not always possible nor expedient to use this system. I have in mind a dental equipment shop where production was fairly limited. Twelve men were employed in the entire finishing room. From the time metal parts entered the finishing room, after they had been thoroughly cleaned, the work was distributed in such a manner that production was always in balance. This is the way it was done:

Each man was held responsible each day for finishing a given number of parts in their entirety. For example, let us assume that among other equipment, the production consisted of seven dental chairs. One operator was responsible for finishing seven cylinders (one for each chair). Another operator finished the arms of which two are required for each chair.

As the arms are smaller than the cylinders, they require only about half as much time to finish, so this operator can finish 14 arms daily. Another part equally as large as the cylinder, but of which two are required for each chair, was given to a third operator who maintained his quota of 14 pieces, with the aid of a lathe which facilitated the sanding and rubbing operations. One man did all of the striping.

By finishing the work in its entirety, I mean, each operator putty glazed, sanded and inspected his quota of parts. Next he applied the first coat of baking enamel and placed the parts in the oven. During the baking period, the operator sanded the first coat on a previously baked lot of parts and then applied the second coat of enamel. The second coat lot replaced the first coat work in the oven, the work proceeding in this manner until all of the parts were finished and rubbed.

Each man became expert in handling and finishing his particular set of parts. Production was always in balance, and it seemed as if the work were produced by one big fellow with two dozen arms—an excellent way to have the production process organized. —F. Mannhardt.

All the color combinations may be good, but one combination will be far more attractive than the others because the colors are in proper balance.

Metal Finishing Department

Cleaning-Handling Baking & Polishing

Modern Equipment Used for

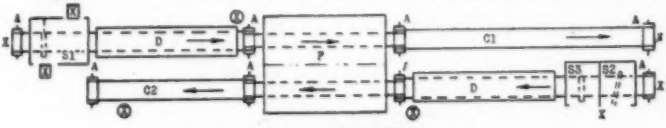
Finishing Porcelain Enamel Wall Tile

Superintendent of the Louisville Enameled Products Co., Louisville, Ky., describes and illustrates how conveyorized, semi-automatic equipment is used in finishing 2000 wall tile per hour.

By R. E. BURNETT

THE VITREOUS enamel division has enjoyed perhaps the greatest advancement of any branch of the entire finishing industry. I understand that great strides have been made in the materials used in wood finishing, but the improvements in the vitreous enamel field embrace both material and equipment. This advancement has been reciprocal; one is dependent upon the other and one would be useless without the other.

In Fig. 1 is shown the floor plan arrangement of what is



KEY TO REFERENCE LETTERS

A —Conveyor drums
C1—Ground-coat cooling conveyor
C2—Cover-coat cooling and inspection conveyor
D —Gas-fired dryers
F —Electric furnace
S1—Ground-coat spray booth
S2—Cover-coat spray booth
S3—Highlighting spray booth
I —Operator's station
M—Inspector's station
M—Hand-spray operator's station

Fig. 1—Floor plan arrangement of conveyorized semi-automatic equipment operated to move, spray, dry and fire vitreous enamel coatings on flat and slightly curved pieces of metal. Finishing operations begin at upper left where ground coat is sprayed in booth S1; conveyor carries sprayed pieces through electric drier D, electric furnace F, and to end of line where they are transferred to other conveyor and carried back.

probably the last word in conveyorized semi-automatic equipment operated as a single unit for the application and firing of vitreous enamel on certain types of metal products. This equipment may be used for finishing flat and slightly curved pieces within certain limits of size, but it is especially adapted to finishing kitchen and bathroom wall tile.

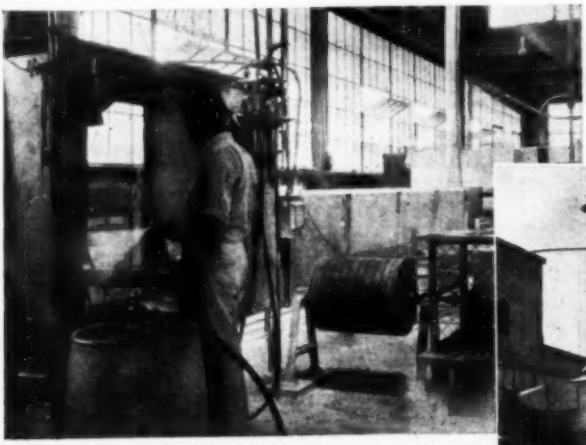


Fig. 2 (Above)—Spraying ground coat on face side and edges of tile which is moving through booth by conveyor. The conveyor drum at right of operator is motor driven through a variable-speed transmission to permit of varying the speed of conveyor to suit the requirements of work at hand.

Fig. 3 (Right)—One of the cyclone collectors into which exhaust piping carries excess enamel spray which is later reclaimed. The stack above cyclone releases the free air from which the spray dust is separated inside the cyclone.

This unit (see Fig. 1) consists of a 2-operator spray booth *S1*, which I shall refer to hereafter as the "ground-coat booth," a double spray booth *S2 & S3*, which I shall call the "cover-coat" and "highlighting" booths respectively, two gas-fired, continuous dryers *DD* and one electrically-heated, double-furnace *F* having a heat range from 0 to 2000°F. The entire unit is serviced by a variable-speed double conveyor system made up of six sections. Including working space, this equipment occupies a floor area 20-ft. wide by 120-ft. long and is operated by six girls (loaders, inspectors and unloaders) and three men (two hand-spray operators and one spray booth attendant).

The production on this unit is 2000 pieces of tile per hour, or an average of 250-sq. ft. per hour. We operate this unit on three 8-hour shifts and, deducting the time required to change colors once in the 24-hour period, we obtain 42,000 pieces of tile, or an average of 5,250-sq. ft. per day.

That you may obtain a more thorough knowledge of this equipment and how it operates, I shall give a detailed description of the process used in finishing wall tile.

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Tile blanks are placed in monel pickling trays which are picked up by a traveling electric hoist operated on overhead trucks. Loaded trays are lowered into a hot chemical solution where they remain from 20 to 40 minutes depending upon the amount of grease on the surface of the steel. Next they are rinsed in water and then placed in sulphuric acid from 10 to 25 minutes, followed by first a water wash to remove the acid and then into a nickel dip solution for 15 minutes. A cold water wash is followed by a hot alkaline wash to remove all traces of acid and then the tray is lowered into a gas drier pit where the blanks are dried preparatory to delivery at the conveyor just outside the ground-coat booth *81* (see Fig. 1).

At this point the pickling of the blanks is inspected as they are placed one by one on the cable conveyor which carries them into the ground-coat booth. By means of a spray gun mounted on a mechanical device the underside of the tiles are sprayed with the ground coat. At the same time the two operators, working at offset positions at this booth, spray the ground coat on the face side and edges of the tile as shown in Fig. 2.

Before going any farther, I want to call attention to this *white* ground coat material, so necessary to the light-colored finishes. This is a decided improvement over the blue ground coat which changes to blue-black in firing, and it is a direct result of extensive research and development.

Upon emerging from the ground-

Fig. 4 (Right)—Interior of part of double spray booth where cover coat is sprayed automatically from fixed nozzles while tile pass through on conveyor.

Fig. 5 (Left)—Close-up of automatic transfers (from multiple-cable conveyor for spray booths to multiple-chain conveyor operating inside furnace) located at both infeed and outfeed ends of each firing furnace.

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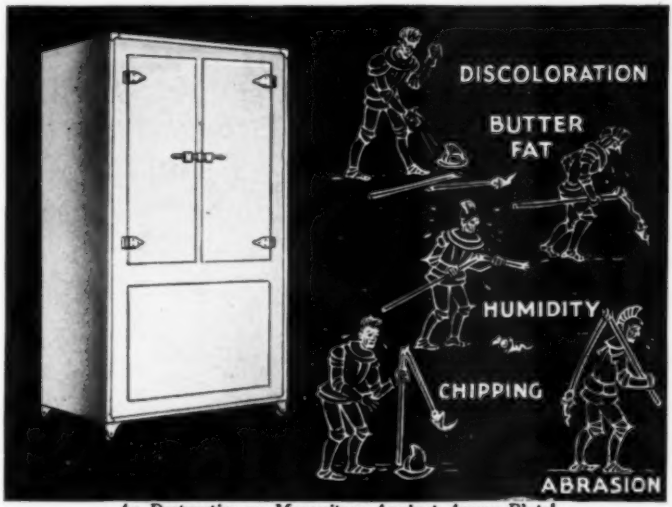

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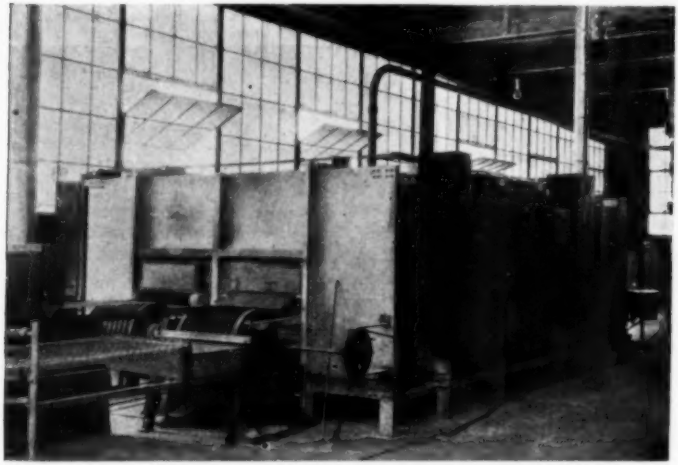

Fig. 6—View of electric furnace wherein vitreous enamel coatings are fired. Notice two controls on side of furnace by which temperature in both ground-coat and cover-coat sides of furnace may be regulated. Also note auxilliary drive between sprocket wheels outside of furnace; this maintains uniform speed on the cover-coat conveyor between the cover-coat booth and the furnace—preventing possibility of slight slippage between the cable and alloy chain transfer on a combination conveyor of this length.

coat booth, the tile pass through the gas-fired, continuous dryer. This dryer is 16-ft. long and is operated at a temperature of 180° F. With a conveyor speed of 3½ ft. per minute, about five minutes are required for the tile to pass through the dryer. At the outfeed end of this dryer the tiles are inspected before they enter the furnace.

A patented feature of this equipment is the means of transferring the tiles automatically from the cable conveyor to an alloy chain conveyor which operates inside the furnace. Due to the intense heat in the furnace, the light gauge cables would quickly scale and burn through.

Automatic transfers are located at both the infeed and outfeed ends of the double furnace, those at the outfeed end are shown in the close-up Fig. 5. The furnace is 14-ft. long and a temperature of 1440°F. is maintained on the ground-coat side. Of course the chain conveyor inside the furnace travels at the same rate of speed (3½-f.p.m.) as the cable conveyors, producing a firing period of four minutes.

Tile emerging from the furnace and being transferred to the cable conveyor *C1* travel a distance of 30-ft., during which time, they cool sufficiently to be transferred by hand from this conveyor to the one that enters the cover-coat spray booth. This double spray booth is shown in Fig. 4. The speed of the cover-coat conveyor is 4-ft. per minute.

As the tiles pass through booth *S2* the cover coat is sprayed on the face side and edges by three fixed-position guns operated as a

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Watching the processing of materials which have been finished with our Flexible Lacquers is always interesting . . . . even to us. One can almost see the molecules get up under heavy stamping pressure, move out of the way . . . . and return to take up their original positions. The most intense pressure *fails* to break the film. By the way, our lacquer film, dug into with a pen-knife and *deliberately* lifted, curls like a thing alive.

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single unit. In booth *83*, which of course is the other side of this double booth, there is a spray gun mounted on a mechanical device, and as this gun moves back and forth at right angles to the conveyor, the highlight or over-finish coat of a slightly darker color is sprayed, producing in the finished tile a variegated effect.

Leaving the highlighting booth, tiles pass through another gas-fired continuous dryer 16-ft. long where the cover and highlight coats are dried for four minutes at 180°F. At the outfeed end of this dryer, tiles are again inspected just as they are being automatically transferred from the cables to the chain conveyor which carries them through the cover coat side of the furnace where they are fired for 3½ minutes at 1420°F.

As the tiles leave the furnace, they are again automatically transferred to the cooling cable conveyor *C2* on which they travel about 25-ft. As the tiles are removed (by hand) from this conveyor, they are inspected and placed in trucks to be delivered to the packing department.

All of the spray booths are designed to retain the excess enamel sprayed from the guns. This material is drained and remixed to be used again. The exhaust pipes leading from the each spray booth extend outside the building to cyclone collectors in which the dry, powdered enamel settles to the bottom, from which it is taken to be reclaimed. These cyclone collectors are equipped with ventilators (see Fig. 3) at the top whereby adequate circulation of air is provided to give the fans sufficient pull in the spray booths.

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DIVISION OF ROSS INDUSTRIES CORP.

The necessity for change in the design and finish of so many products goes right back to what is the consumer's idea and not the manufacturer's idea of the suitability of the design, finish, color, etc. The consumer is going to get what he or she wants. Either you or your competitor will give it.

Finishing Equipment Bulletin

The Weber & Scher Mfg. Co., Inc., 263 Sussex Ave., Newark, N. J. has placed in an attractive folder its Bulletins No. 11, 12, 13, and 14, which illustrate and describe the "Webscher" surface-coating machines, coating machine No. 8780, electrical laboratory ovens, and finish testing machine.

Despatch Oven Co. Activity

The following announcements of sales representative appointments marks the start of expansion of the Despatch Oven Company's Sales and Engineering Department to give those interested in industrial ovens and equipment a more prompt and personal service.

Jones and Manter Corporation, 120 High St., Boston, Mass., have been appointed District Sales Representatives in the New England Territory, with exception of western Connecticut.

Mr. F. C. Butman has been reappointed as District Manager of the Western New York Territory. Mr. Butman went to Roneo, Ltd., Romford, England as an efficiency engineer on a recent leave of absence. He has now returned.

Mr. E. B. Wolf joined the Detroit Office of the Despatch Oven Co. to assist in the sales of industrial ovens and equipment in the Eastern Michigan and Northwestern Ohio Territory.

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You know how awnings fade in August. The actinic rays of the sun are hard on things now. They attack lacquers, too. Ordinary "outdoor" clear lacquers let the metal beneath darken and discolor.

Our notion of a *real* outdoor lacquer is one that coolly defies sun and weather—winter and summer—rain or shine. One that *protects*. And we don't mean mere ability to keep from peeling, blistering or cracking. We mean protection for the original *color* of the metal.

That's why we're offering Actino* and asking you to test it to your heart's content.

We hope you say, "Oh, yeah?"—because we'll send you a sample and you can prove it for yourself!

* Reg. U. S. Pat. Off.

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Finishes on Metal Parts of Telephone Apparatus

By
H. G. ARLT

Summarizing the principal finishes used on Bell telephone parts; what materials and methods are used, and why; the development or adoption of improved finishes

FINISHES are applied to metallic parts of telephone apparatus to obtain a uniform and pleasing appearance, and to protect against corrosion. These are the principal reasons, but finishes are also applied for specific purposes such as electrical insulation; heat or light reflection, or absorption; and to prevent sticking of parts.

At the present time some hundred standard metal finishes are being used on telephone apparatus parts. Paints, varnishes, enamels, baking japans, nitrocellulose lacquers and shellac solutions come within the grouping of organic coatings. The inorganic finishes consist of metallic coatings applied by various plating and dipping processes; and also several inert coatings such as the Bower-Barff and phosphate process finishes.

Paints are not used very extensively on metal parts owing to their softness. Paints consist of oxidizing oils, such as linseed oil, combined with suitable pigments and dryers, with turpentine or mineral spirits as thinners. Because of slow oxidation of the linseed oil, paint films remain soft for a period so relatively long as to render them unsuitable for apparatus to be assembled within a short time after the finish is applied.

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In both air drying and bake type enamels, faster drying is obtainable. Gloss is superior to most finishes. Durability on weather exposure is characteristic of all Rezyl-formulated finishes. Rezyls are available in a variety of types differing in physical properties. All of them can be used to advantage in finishing wood, metal, paper, leather or fabric.

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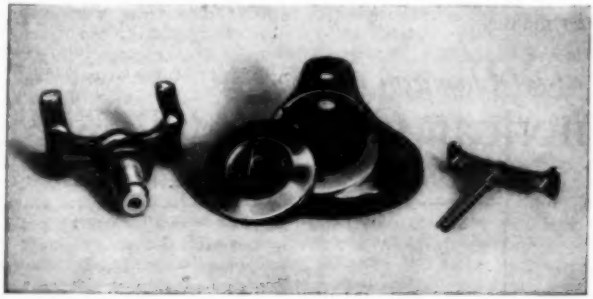
from bodied oils, dryers, gums, resins and thinners are used in metal finishes principally as vehicles for aluminum bronzing powder. A bright, light-colored finish for structural framework is produced in this way, which gives a pleasant appearance and due to its light color and reflecting power adds considerable to the effectiveness of central office illumination. Clear baking varnishes are also used as vehicles for aluminum bronzing powder, the finishes in this case being applied mainly to apparatus parts and covers subject to much handling. The baked aluminum finishes have a much higher resistance to wear and impact than the air-dried finishes.

Baking varnishes pigmented with aluminum powder offer the only means of obtaining a highly baked finish of light color, as all other light-colored pigments darken with baking, the darkening becoming deeper as the baking temperature is raised. Baked aluminum finishes have replaced black japan finishes on central office apparatus and have been in use for the past two years. They have given satisfactory service and in addition have materially brightened up the interior of central offices.

Baking japans have been used on telephone apparatus for many years. Black is the usual color although some green and brown japans are being applied to telephone parts at the present time. The use of japans other than black leads to difficulties because of color differences resulting from variations in baking temperatures which occur in commercial practice. Their use therefore is discouraged.

The japan used at the present time produces a semi-dull black finish having the appearance of a machined and polished piece of hard rubber from which it derives its name. The name "rubber finish japan" is somewhat misleading, however, in that the japan contains no rubber.

This material is the result of several years co-operative effort of the Western Electric Company's and the Laboratories' engineers to develop a material suited to the



Parts of handset mounting finished with two coats of rubber finish japan. Base and apparatus blank are of steel and have been phosphate-processed previous to japanning. The japan has been applied directly to the sandblasted surfaces of the cradle and plunger, both die-cast of aluminum-base alloys.

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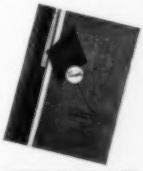

Full details on how the nation's leading industries are cutting finishing costs are included in our "Guaranteed Savings" book. Write for your copy *today!* It's free.

specific needs of the Bell System. It produces a hard, though elastic, finish which has the strongest resistance to mechanical wear and impact of any of the numerous organic finishes tested up to the present time in the Laboratories. This japan also offers excellent resistance to deterioration from perspiration which was one of the most important considerations leading to its adoption.

The use of nitrocellulose lacquers on telephone apparatus undoubtedly will become more and more extensive in the future as their development proceeds. Polished, brushed and grained nonferrous metals such as brass and copper are usually given a coat of transparent lacquer to retard tarnishing. Pigmented lacquers, commonly known as lacquer enamels, are used for producing finishes in color. These materials produce films having the next best mechanical characteristics to baking japans.

Shellac solutions, which are used extensively for finishing wood, are seldom used on metal parts. Their only use on telephone metal work is for insulation on transformer laminations. Asphaltum paints and coal tar pitch also have insulation uses. The asphalt solutions applied as finishes produce soft electrical-insulating films and the coal tar pitch serves as an insulating corrosion preventive on loading coil cases which, when placed underground, are subject to considerable electrolytic corrosion due to stray ground currents. Rubber mixtures cured by heat alone are used to a limited extent to build up heavy electrical insulating coatings on irregular parts.

The organic finishes described above are applied principally by atomized spray, although some are applied by dipping, brushing and flow-coating.

Of the inorganic coatings applied to metal telephone parts, the metallic platings are by far the most important. Zinc, applied by electroplating, is the most widely used and has proved to be the most effectual of all plating in providing corrosion protection at reasonable cost for ferrous apparatus parts subject to normal indoor exposure.

Metal plating and hot metal dipping processes are also employed —some for rust prevention and some for other purposes including preservation or decoration of the parts so covered.

This brief summary of the metal finishes gives only a birds' eye view of one field of endeavor toward improved appearance and better functioning of telephone apparatus. New materials and methods of application are constantly being investigated and as a result the finishes in use are constantly undergoing revision and improvement.—*Bell Laboratories Record.*

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New Materials and Equipment

Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Cleaning Compound

A specially prepared, highly concentrated paste for cleaning dirt from paint, varnish, lacquer and enameled surfaces has been recently placed on the market by The DeVilbiss Co., Toledo, Ohio.

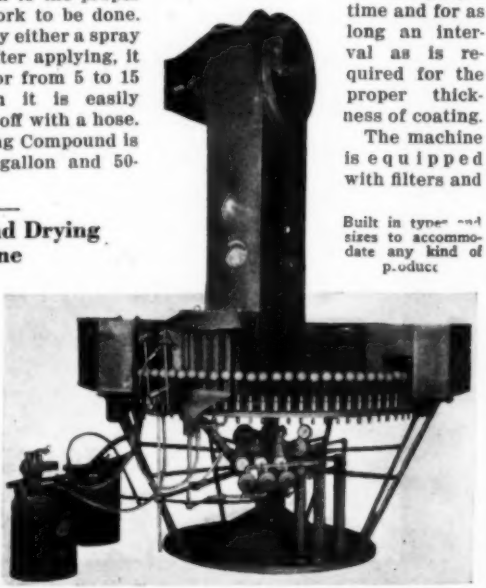
DeVilbiss Cleaning Compound is in semi-paste form and may be used on both interior and exterior surfaces. Cold water from a 1-1 to a 10-1 proportion is used to dilute the preparation to the proper strength for the work to be done. It may be applied by either a spray gun or a brush. After applying, it is allowed to set for from 5 to 15 minutes, and then it is easily sponged or washed off with a hose.

DeVilbiss Cleaning Compound is sold in 1-gallon, 5-gallon and 50-gallon containers.

Aircoating and Drying Machine

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., announces a 90-spindle automatic aircoating and drying machine on which articles can be aircoated at a speed to suit the loading and unloading ability of the operator. The automatic air-operated convertible airbrushes are easily and quickly adjustable from a fine line to a broad fan spray, for completely covering articles from the smallest to the largest in size. Universal swivel sliding gun mountings permit setting the airbrushes at any angle required to conveniently reach the surfaces to be coated, and an automatic off-and-on air control allows each gun to spray at the proper time and for as long an interval as is required for the proper thickness of coating.

The machine is equipped with filters and



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regulators to provide clean, dry air at the desired pressure for the work. The frame work and housing are of all-steel construction electrically welded. The mechanism is operated by a flexible air-motor drive equipped with self-aligning ball-bearings, and has quick speed change without changing gears, belts or friction. Adjustable, removable spindles with cam rollers and gears facilitate adapting the unit to a great variety of sizes or styles of articles or parts.

The cylindrical drying tunnel (electric triple wall, asbestos lined) with low or high temperature as desired, saves handling of articles being spray coated.

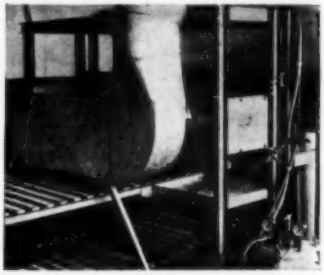
The unit operates entirely on air pressure and requires only from 20 to 30-cu.ft. of free air per minute at 5 to 70-lbs. pressure.

Automatic Spray Machine

The Willard C. Beach Air Brush Co., Second & Warren Sts., Harrison, N. J., announces for the industrial finishing industry the "Beach Automatic Spracoater" which is based on a patent granted by the U. S. Patent Office to Mr. Beach, July 7, 1931.

Briefly this machine automatically sprays objects passing along on a conveyor, or material fed through, on or between rollers, such as sheet metal, artificial leather, wallpaper, etc. The spray shuts off automatically as the nozzle passes back and forth over the edges of the work. One nozzle or several can be mounted on the reciprocating carriage. The spray coatings can be regulated from a control on the side while the machine is in operation.

The machine is adjustable and controllable for a large variety of production work. The mounted



A complete installation consists of automatic spray coater, exhaust system, air compressor, unit and pressure feed air-brush.

nozzles, arranged to travel back and forth across the conveyor, will spray any materials that can be sprayed by ordinary hand-operated spray guns. A single nozzle will coat six panels per minute, each panel being 3-ft. wide and 4-ft. long.

When more than one nozzle is used different colors can be sprayed to give two-tone and rainbow effects, and also to produce a spattered and veiling finish.

Adjustable-Pitch Fans

The Universal Fan Co., 1030 West 29th St., Indianapolis, Ind., announces a new series of large propeller-type ventilated fans 4½-ft. in size. These fans are made of special alloy aluminum and are so designed that the pitch of the blades is adjustable. The hub of each fan is drilled and key-seated for the standard size shaft of a motor suitable for driving it.

One of these fans, driven 1750-r.p.m. by a 7½-h.p. motor, will deliver 57650-cu.ft. of air per minute. The blades are perfectly balanced statically and dynamically, and are smoothly polished to a mirror-like finish.

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It looks right - spreads right - but what about next year? That story is covered up. The adhesion of undercoats - turning gray under light exposure - chalking - alligatoring - all these and many other ills to which paints, lacquers, and varnishes are subject, occur after the product is in use. But with the Weather-Ometer, by applying the coatings to test panels and setting up in the accelerated cabinet test conditions approximating those under which the product will be used, a few days or weeks will tell all that months and years of use will bring out. A measure is obtained in terms of Weather-Ometer Days that can be depended upon. The various Weather-Ometers and their uses are shown in Bulletin I. F. 8 sent gladly on request.

We are also Creators and Distributors of Fade-Ometer—Standardized Sunlight; Launder-Ometer—Standardized Machine for Laboratory Washing Tests; Wear-Ometer—Standardized Wear Test Machine.

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For primers and surfacers of proper composition; for non-lifting top coats; for flexible finishes that permit forming the finishing article; for any requirement or difficulty in the application of the NEW decalcomanias, communicate with us.

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Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

French Polishing Furniture

I am in the furniture refinishing business and have been polishing furniture quite extensively without trouble. However, lately I encountered difficulty in polishing and padding. To repair the tops of tables and pianos where the varnish had been cracked by exposure to the sun, etc., but not enough to necessitate revarnishing, I French polished the surfaces with alcohol and French varnish, using several drops of lemon oil to prevent the pad sticking.

The job was excellent, but the varnish failed to harden; instead a greasy top remained, leaving prints the moment you touched the surface. I would appreciate information on the cause of this, and also on how to polish furniture.—J. P.

It is apparent that you have used too much lemon oil in your French polishing. Or it may be that the original varnish was of a very poor grade. I believe you will have better success with French polishing if you substitute paraffin oil for the lemon oil. Paraffin oil has a tendency to remain on the surface, while lemon oil penetrates.

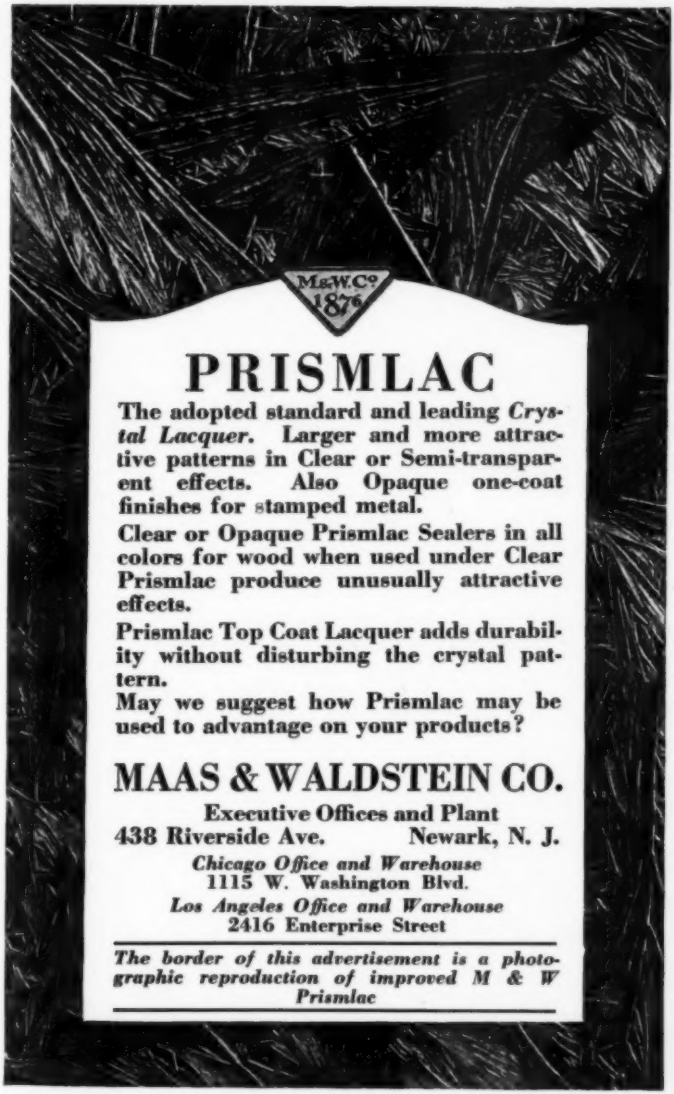
As you probably know, French polishing is intended primarily to build up a damaged surface where the damaged area is not too large. One of your troubles may be that you have attempted to refinish an entire piece by this method.

My suggestion on tops having a cracked or crazed varnish finish, is to: Wash the top thoroughly to remove all dirt, grease and foreign matter. Soap and water, or a little benzine may be used for this purpose. After the top is dry, apply a coat of denatured alcohol, taking care to apply the alcohol evenly. Do not attempt to brush this material in. Simply apply with light even strokes until the entire surface is covered; then stop. Allow this to dry thoroughly, sand with No. 5/0 sandpaper, clean off well, and apply a thin coat of good varnish. After the varnish is dry, it may be rubbed in the usual manner.

In case the surface is too badly crazed or cracked to respond to this treatment; it is advisable to apply varnish remover, clean off, wash with denatured alcohol to remove all traces of paraffin oil, (present in most removers) and then start in with the filler and build up the entire finish in the usual manner.

Varnish finishes which have become dull and do not contain an excessive number of cracks may often be restored by washing the surface thoroughly and applying a coat of alcohol as above described.

Regarding the particular job in which the varnish failed to harden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after your treatment with alcohol, French varnish and lemon oil, you might try washing the surface very lightly with an alcohol rag. Of course, great care must be taken, and it may be advisable to use just a small amount of paraffin oil in this operation. This will have a tendency to prevent the rag from sticking. The purpose of this alcohol wash is to attempt to remove the effects of lemon oil. In the event this does not prove satisfactory, I know of nothing else but varnish remover that will produce the results you wish to obtain.—P. B.

Honey Maple Finish

We are writing you with reference to the honey maple finish for our breakfast sets. We have very carefully gone over the honey color formula given on page 58 of June INDUSTRIAL FINISHING, but it is not quite clear to us. It states: "Sponge the surface to be finished with clear water and sand smooth. Dissolve 1-lb. oxalic acid to one gallon water, and stain the surface with this material. Let dry about 10 hours and then stain with a solution made up in the proportion of 4-oz. of tincture iron chloride to one gallon of water, etc."

How do these various processes, such as staining with oxalic acid and water, then staining with solution of tincture of iron chloride and water effect the wood? If you would furnish us with a more detailed explanation of the different processes, stating the definite effect of each process on the wood, we would know whether our present method of finishing is correct, or whether we can improve it. As it is, we are using a seal-brown water stain, dissolved in hot water, and we do not always turn out a clean job. Certain parts of the wood show dark spots; not a uniform color. Can this be overcome by the oxalic acid and tincture chloride?—C. C. Co., Inc.

Let us consider the various operations listed in the formula in the order mentioned. Sponging the surface to be finished with clear water raises the grain of the wood. When these raised wood fibers are cut off in the sanding operation, the surface becomes smooth and remains in that condition. In other words, the subsequent stain coats will not raise the wood grain to an appreciable extent.

The oxalic acid and water application is strictly a bleaching operation. As you know maple, birch, beech and oak often contain stains and discolorations in the natural wood. Sponging the surface with oxalic acid and water will in most cases remove these discolorations. It is advisable to allow the acid and water mixture to dry about five hours, or until the oxalic acid crystals appear on the surface of the wood. Then wash or sponge the surface with clear water to remove the acid crystals, and let dry ten hours.

The application of tincture of iron chloride and water is intended to tone and uniform the surface. When this mixture is applied on maple and birch, it gives the wood a golden shade and will "set" the color of the wood. It has been found that after removing discolorations, and then applying the stain directly on the wood, some of these discolorations will reappear. Tincture of iron chloride and water has a tendency to eliminate the reappearance of stains. After this operation the

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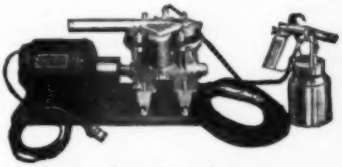

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surface has the appearance of having been sprayed with a thin coat of orange shellac.

Regarding your question about the use of seal-brown water stain and hot water producing dark spots in your present finish, you do not state what species of wood are being used. Then, too, the cause of these dark spots will have to be determined.

If they are caused by stains or discolorations in the original wood, I suggest you follow the above procedure. On the other hand, if these dark spots are caused by soft textured areas in the wood surface, or end wood grain, then you will either have to apply a weaker stain solution to these areas before staining the harder textured surface surrounding them, or apply a very thin coat of white shellac to the soft textured areas, allow to dry and touch up with sandpaper, before proceeding with the staining operation. However, I favor the weaker stain method, provided you experiment with the colors, so that when the piece is completed a uniform color will result.

If the dark spots are caused by soft textured areas, and these areas are not visible before the finish coats are applied, the dark spots may be bleached (after the stain has dried) with oxalic acid and water. In this case, whether or not you should follow this with tincture of iron chloride, will be determined by the process used on the work and the color desired. It may be advisable in this case to apply a very thin coat of white shellac to these spots, or in the event that just enough bleach is applied to bring the color up to the rest of the work, it will not be necessary to coat these spots with any material.

I suggest you write one of the

finish manufacturers (name on request) for information on "Early American" acid stain, to obtain recommendations on the use of this stain, and then experiment with this product on some sample panels and strips of the same species of wood you are using in your breakfast sets. I cannot say definitely that this will produce a superior color than the seal-brown you are using, but offer it as a suggestion of improvement.—C. J. L.

Rubbing Wood Finishes

We rub our varnish and lacquer wood finishes with steel wool and oil which dulls the surface. We are seeking some compound which will bring back the luster in the finish. Have you a suggestion?—C. M. P. Co.

The use of steel wool and oil has an extremely dulling effect on these finishes. I suggest you use a mixture of 30% pumice and 70% rottenstone with water instead of oil. You will find that water will produce a much clearer job than oil, as the latter has a tendency to eat into the finish, causing the dull or clouded effect.

On work that has been completed, I suggest you rub the surface with rottenstone and water to bring back the luster.

The type and size of your product, quality of finish applied, and the class of results desired all enter into the method of procedure in rubbing and polishing. Rottenstone has very little cutting ability, while pumice compares favorably with fine grade steel wool in its ability to cut the finish. If the above percentages of the combination of rubbing materials do not produce the desired results, either in final finish or in time, they may

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be varied to suit your product. Adding more pumice will accomplish results more quickly and will produce a dull finish. Increasing the amount of rottenstone will produce directly opposite results. —F. D. M.

To Seal Mahogany Oil Stain

Referring to a question on the above subject in July issue (page 63), the articles to be refinished should be cleaned to the wood, or as nearly as possible, first with varnish remover, then with a prepared cleaner and bleach which should be used boiling hot; rub with steel wool and wash with cold water. When the surface is thoroughly dry, smooth it with sandpaper.

I would avoid the use of the lacquer aluminum in this case as you will be saving yourself trouble. Mix the aluminum powder in a 2-hour varnish or a regular bronzing liquid. Aluminum powder mixed this way is often used as a sealer where a stained surface is going to be repainted. I suggest giving the cleaned surface a thin coat of shellac before coating. Then apply the aluminum; if any trace of the stain appears, shellac again before coating.

If you prefer to avoid the expense of entirely cleaning off all the old finish, I suggest dulling the old finish, being careful not to cut through to the stain; you may get a passable job this way without much expense. There are several good sealers on the market, suitable for your purpose.—J. K. Cooper.

Today, manufacturers are not limited to the choice of a few materials from which to construct or design or finish their products.

Wood Fillers and How to Use Them—I

By C. D. YOUNGS

The purpose of filling, what ingredients should be included in good fillers, how to use fillers effectively and economically, and where to find the causes of many puzzling troubles that occur in modern wood finishing

IT IS FAR too often the case that the superintendent and finishers, trying to trace reasons for an imperfect finish, find to their sorrow that the use of a wrong type of filler, or the improper use of the right kind of filler is responsible for their trouble. The space between filler and finish coats offers many opportunities for annoyance to the furniture finisher; yet of course each phase of the work involved must stand or fall solely on its own merits.

Despite the risk of having this article considered at the beginning as a first-grade primer for beginner finishers, it may be well to review briefly some of the major characteristics of wood fillers, as well as to touch upon some phases of their operation.

Why Filler Is Used

Fillers, as the name implies, are for the purpose of evening up the surface of the wood and filling up pores or depressions. They must dry sufficiently hard so that the succeeding coats of finish will not sink in and give the piece of furniture a pitted appearance.

Not all kinds of wood require a filler, but where filling is necessary, practice has proved that a paste wood filler is better for open-grained woods such as oak, ash, chestnut, mahogany, walnut, etc., while a liquid wood filler is better for close-grained woods such as gum, birch, cedar, maple, cherry, poplar, etc. There is one exception to this rule and that is the case of birch to be stained mahogany; although classed as a close-grained wood, birch takes a better mahogany finish when paste filler is used, since this brings out the grain and contrasting figure more fully.

Modern efficiency has displaced and relegated to the past the old-time "home-made" fillers, which were made of cornstarch or other vegetable materials subject to decay. Now there is little or no difference in the materials used in fillers as a class, although there is a vast difference in the grades of such materials used by different manufacturers.

Filler Ingredients

The three principal ingredients are silex (or silica, which is an inert white, fairly transparent sand secured by crushing and treating quartz rock) pure raw linseed oil, and a light-colored japan drier made especially for fillers. To this is often added about 15% asbestine which tends to keep the filler in suspension and, by a retention of the oil, prevents too quick hardening in the package.

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For good workmanship it is essential that the filler purchased be manufactured from hard quartz silex, since this has sharp crystalline edges which make it grip into and adhere to the pores of the wood. Other kinds of silica that are softer have rounded edges, are non-crystalline and of no value whatever in the manufacture of wood fillers; yet they are often used because of their cheaper cost. Hence it is well to know the firm from whom one is buying and not be led astray by an apparent saving of a few cents per pound.

In reducing paste wood fillers in the shop it is important that a good grade of naphtha be used, one absolutely free from grease, sulphur, water, or any other foreign substance. Most refiners market a good grade of naphtha, suitable for fillers, under the name of P. & V. M. naphtha (Paint and Varnish Makers naphtha).

It is very simple to make a grease test of naphtha; simply pour a few drops on a sheet of white paper and if there is no stain left when it has evaporated, it is safe to use.

The amount of reduction the filler should take is largely dependent upon the work at hand, a coarse open-grained wood requiring filler of a heavier consistency than wood with smaller pores. The average reduction, however, is from 12 to 15-lbs. per gallon of reducer, while finer-grained woods may require as little as 8 to 10-lbs. The finisher is the best judge of this.

Preparing for the Filler

It is very important that the wood to be filled be thoroughly cleaned before the filler coat is applied. This applies not only to any surface dust that may gather but

also to all dust from sanding, or from the cabinet department operations. This dust should be blown out from the pores; such dust, being of a different body than the filler, will not thoroughly pack the pores, and it will likely cause air pockets to form in the bottom of the pores. Then, after the filler is wiped and the finish coats are applied, there will be a pit or depression caused by the air bubble from the unfilled pore.

Wiping will not remove this dust, so compressed air should be used to blow the particles out and render the pores ready to receive filler all the way to the bottom.

Handling of Filler

Unless fillers are used with some rapidity it is better to buy them in metal containers rather than in wood since the wood will absorb some of the oil and thereby destroy the proper balance of ingredients.

An opened package should have an air-tight cover on it at all times for as oxidization takes place the top will become hard. If these hard particles are used in work they will be difficult to wipe off and will scratch the wood. When this has occurred it is far cheaper to carefully scrape off the hardened top and throw it away.

Another thing which is to be guarded against is the mixing up of too large a batch at one time. Even if one day's supply is mixed, it should be in at least two containers, for after being reduced with naphtha and then standing a while, precipitation of the silex takes place; then, unless it is stirred thoroughly while being used, it is probable that the filler taken from the top of the container will have an excess of oil while that in the bottom will be deficient in oil and have too much pigment.

If thoroughly stirred, it should be taken on the brush from a flat container, and the brush should be wiped around the bottom of such container while being filled.

(To be continued)

Color in industry is becoming very important; it is as important to every manufacturer.

Caulking Compound Now Sold the Year Around

The Calbar Paint and Varnish Co., Philadelphia, Pa., manufacturer of Caulk-O-Seal, a caulking compound, reports a changing condition in the buying of this commodity. In former years the only time caulking compounds could be merchandised in any volume was in the fall. This year, however, the sales activity in this line has proceeded at a steady rate, due probably to the new method of packaging in a tube with pressure key and insert nozzle. Caulk-O-Seal is also packaged in quarts, gallon cans and drums of various sizes.

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EDITORIAL

"Way Out of Depression"

Mr. John G. Graves of Leominster, Mass., sends in a suggestion that is interesting, timely and significant—as he writes in his letter: "A little tip taken from several years' experience, which could be put to good advantage for the benefit of all concerned." His suggestion follows:

"What the paint and lacquer manufacturers need to pull out of this depression—to get on a hard speedway—is a 'fault-finder' or 'remedy-man.' A man may be a good salesman, but not a finisher. The customer complains of having trouble with the goods; it may be the finish manufacturer, but nine times out of ten it is the finisher of workmen who precede the finisher.

"The salesman takes a sample back to the laboratory, finishes the piece, and it is okay, but when it comes to putting this finish on several thousand pieces, trouble shows up, and he doesn't know which branch to take up. The fact is the salesman has to spend several days with the customer to locate the faults—while other salesmen are covering his route and getting orders belonging to him—whereas if the trouble man, who has had several years' experience in finishing, could remedy the trouble this circumstance would not slow up the salesman and it would bring the two ends together and continue a satisfactory business relationship between the maker and user of finishing materials."

New Final-Coat Finishes

At the closing of the Chemical Exposition, held early this year in New York City, an address was given by Dr. Charles H. Herty, consulting chemist, in which he spoke of synthetic resin as a basis for new lacquers, and he expressed the belief that the lacquer industry of the future would unfold a tale of romance because of the keen contest between nitrocellulose lacquers and the old-line varnishes. Dr. Brady declared that, "the addition of synthetic resin products made the whole thing look like a big algebraic problem." He predicted a "war in lacquers in this country in a very few months."

The finishing industry was well represented in a large number of booths at the exposition.

Aluminum Paint; Extreme Heat

There is now on the market a heat resisting aluminum paint which is said to successfully stand temperature up to 1200° F. The material is handled in the ordinary

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Synthetic Resin from Glycerine

Research workers and chemists have been working with the development of and uses for synthetic resins derived from glycerine since 1912. The entrance of glycerine and phthalic anhydride into the coating material field has introduced some new and interesting properties for finishing materials. Among them are the wide variations ranging from a hard brittle resin to an extremely flexible one.

Coating materials made with these new forms of resins are particularly useful on certain kinds of surfaces—for example, galvanized iron and aluminum. Varnishes made with these synthetic glycerine resins possess great adhesive properties in addition to being very tough. The new glycerine base materials act as an excellent barrier against water, oil and gas.

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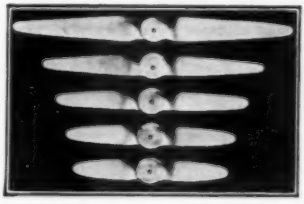

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Imitating Brush Painting

It seems rather unusual to want to have brush marks appear in lacquer but there are occasions where this might be desirable such as making an imitation oil painting. One may spray a coat of clear lacquer on a painting or a photograph and allow it to dry. Take a stiff brush and dip it in thinner and after removing the surplus, proceed to brush the lacquered surface. The thinner will cause the lacquer to soften and the brush marks will remain in the surface. Thus it will be possible to make a finished job that will at least be deceptive.—M. J.

Lacquer Flattening Agents

Any colored gloss lacquer can be made flat by adding a little cork or wood flour ground to a fineness of anywhere from 150 to 250 mesh sieve, stirred well into the lacquer. When this mixture is sprayed over a lacquer undercoat, a smooth, flat surface is obtained—something like the surface of a flat, white wall paint. The amount of luster can be regulated by the amount of cork or wood flour added. Cork flour gives better results.—Wm. Wright.

Flat Lacquers

The opaqueness of flat lacquer is obtained by using a pigment, generally zinc or aluminum stearates, but preferably aluminum. In the use of these flat lacquers care has to be taken that they are well stirred or shaken before spraying, or various shades of luster will be obtained.

A flat lacquer that has no pigment as a flattening agent can be made—a water-white transparent lacquer, but which on drying gives a smooth opaque surface. It is a little expensive to use, but a little experimental work on various other solvents will overcome this; I would also suggest that this lacquer be sprayed over work which has received one coat of sealer and one or two coats of clear lacquer.—W.W.

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